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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/728,883	12/01/2000	Steven Paolini	M-9377 US	5707

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EXAMINER

AKKAPEDDI, PRASAD R

ART UNIT

PAPER NUMBER

2871

DATE MAILED: 11/07/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/728,883

Applicant(s)

PAOLINI ET AL.

Examiner

Prasad R Akkapeddi

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☒ Claim(s) 6-9 and 17-18 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 December 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). ____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____ 6) ☐ Other: ____

DETAILED ACTION

Claim Objections

1. Claims 4 and 16 objected to because of the following informalities: replace 'arrange' with 'arranged'. Appropriate correction is required.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1,12-13 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Evanicky et al. (Evanicky) (U.S.Ptaent No. 6,243,068).

- a. As to claim 1: Evanicky discloses a liquid crystal display (Fig. 2B) containing plurality of layers (112-128) including a liquid crystal layer (118) a backlight (132,136) comprising at least one first light guide (130) for coupling red light (132), at least one light guide (134) for coupling blue light (136), and the light guides are positioned to illuminate a surface of said liquid crystal layer. Although Evanicky discloses red light and blue light and the corresponding light guides, Evanicky does not explicitly disclose s green light and a corresponding light guide, However, Evanicky does disclose two or more light sources (Col. 3, lines 13-17) having different color temperatures for providing color balance. Also, Evanicky goes into extensive discussion about how color balancing could be

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achieved with properly balancing the intensities of red, green and blue colors (Col. 1, lines 29-45). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to insert another light guide for coupling green light into the liquid crystal display as disclosed in Fig. 2B.

b. As to claims 12-13 and 20: Evanicky discloses a first polarizer (120), energizing array (119), a liquid crystal layer (118), a second polarizer (116), a TFT array (119). Claim 20 merely recites the elements of the display without describing the steps necessary for the method.

4. Claims 4,10 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Evanicky in view of Lowry (U.S.Patent No. 6,304,703).

Although Evanicky discloses a liquid crystal display with back light consisting of different colors from LED sources, light guides to transmit this colored light, Evanicky does not explicitly disclose the use of lenses to focus the light outputting these light guides or that these light guides comprise fiber optic cables arranged adjacent and parallel to each other. Lowry on the other hand, in disclosing a LED based fiber optics display apparatus, discloses the use of lens array (Col4, line 22). Lowry also discloses that the fiber optics or other types of light guides (Col. 5, lines 28-29) are arranged adjacent and parallel to each other (Fig.4).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate lens array and the

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arrangement of the fiber optics light guides as disclosed by Lowry into the display device disclosed by Evanicky to enhance the brightness of the device.

5. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Evanicky and Lowry as applied to claim 4 above, and further in view of Abe et al. (Abe) (U.S. Patent No. 5,857,761).

Although Evanicky in view of Lowry disclose light guides comprising fiber optic cables, Evanicky and Lowry do not disclose that these fiber optic cables have deformities to cause light to leak out. Abe on the other hand, in disclosing a similar illumination device, discloses the use of fiber optic cables and light scattering regions (deformities) (Fig. 1), where the light can leak out. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the light scattering regions as disclosed by Abe into the display device disclosed by Evanicky and Lowry to make the connection between the light source and a radiation plate (LCD substrate) easier.

6. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Evanicky in view of applicant's disclosed prior art.

Although Evanicky discloses a liquid crystal display with back light consisting of different colors from LED sources, light guides to transmit this colored light, a color filter, Evanicky does not explicitly disclose that a color filter

is not needed if colored lights are used for the display. Applicant on the other hand, in disclosing the prior art (Fig. 2) discloses that a color filter is really not needed for a liquid crystal display where the colored light sources are sequentially energized. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to do away with color filter as disclosed in Fig. 2 of the application.

7. Claims 2 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Evanicky in view of Hunter (U.S. Patent No. 5,359,345).

Although Evanicky discloses various colored light sources and light guides to couple the light, Evanicky does not explicitly disclose that these light sources are LED sources. Hunter on the other hand, in disclosing a similar color display, discloses red LED array (32), Green LED array (33) and Blue LED array (34) and sequentially shuttering them to achieve display. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the LED sources as disclosed by Hunter into the liquid crystal display disclosed by Evanicky to achieve high resolution, full color display.

8. Claims 11 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Evanicky in view of publication JP-2000171796 assigned to Howa Bussan KK (Howan).

Evanicky does not disclose that the light guides are made out of transparent sheets. However, Howan in disclosing a backlight assembly

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for a LCD, discloses a sheet like light assembly for such displays. When one replaces these sheet like assemblies with the light guides disclosed by Evanicky, they can be stacked on top of each other as recited in this claim. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to insert sheet like assemblies as disclosed by Howan into the display disclosed by Evanicky to achieve compact, light weight device.

8. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hunter in view of Evanicky.

Hunter discloses a method of producing a light emitting diode display and lighting (energizing) the red, green and blue light sources to produce a high resolution, full color display. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to adapt the method described by Hunter to the liquid crystal display disclosed by Evanicky to achieve high resolution, full color display.

Allowable Subject Matter

9. Claims 6-9 and 17-18 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Reasons for Allowance

A search of the prior art did not reveal a liquid crystal display device comprising:

(a) The first light guide, the second light guide, and the third light guide with fiber optic cables arranged adjacent and parallel to each other.

(b) The fiber optic cables have deformities to cause light to leak out of the fiber optic cables.

(c) The deformities are positioned such that light leaks out of the fiber optic cables only in areas corresponding to pixel positions.

(d) The first light guide, the second light guide, and the third light guide have deformities to cause light to leak out of each light guide.

(e) The deformities are positioned such that light leaks out of each light guide only in areas corresponding to pixel positions and the deformities are arranged in columns to coincide with columns of pixels.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Prasad R Akkapeddi whose telephone number is 703-305-4767. The examiner can normally be reached on 7:00AM to 5:30PM M-Th.

The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9318 for regular communications and 703-872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0530.

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PRT

October 29, 2002

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